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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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FCC
Office of the Secretary

In the Matter of	)	
	)	
Amendment of Part 97 of	)	PR Docket No. 85-105
the Commission's Rules to	)	
Permit Automatic Control of	)	RM-4879
Amateur Radio Stations	)	

To: The Commission

PETITION FOR PARTIAL RECONSIDERATION

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February 24, 1986

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SUMMARY

The American Radio Relay League, Incorporated seeks Commission reconsideration of that portion of the Report and Order, FCC 86-18, which precludes operation of amateur radio stations under automatic control while transmitting third-party traffic. This provision is an exception to the general grant of authority in the Report and Order permitting automatic control of amateur digital communications above 50 MHz.

The third-party traffic exception requires manual control of such stations whenever transmitting third-party traffic, thus in effect nullifying any possibility of automatic control of amateur packet repeaters (digipeaters) or computer-based message systems (CBMSs). This is because there is no sure way of discerning whether the messages are the thoughts of the transmitting station or of some third party in the case of the digipeater. CBMS operation, by definition an automatic message storage and forwarding system, would have to be under manual control at all times, as it contains messages originated by third parties.

The International Radio Regulations (Geneva 1979) do not prohibit automatic control in these instances.

Present amateur digital technology makes it impractical as well as unnecessary, to require a control operator at each relay point of the communications. Rather, the potential for abuse, as well as the only real point of application of the control requirement, is at the point of origin of the communication.

The useless application of this control operator requirement adds no protection against misuse of amateur frequencies by unsupervised, unlicensed individuals, but is rather an example of technology having outpaced regulation. The latter should not frustrate or impede development of public service applications of amateur packet technology.

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To: The Commission

PETITION FOR PARTIAL RECONSIDERATION

The American Radio Relay League, Incorporated (the "League"), the national association of amateur radio operators licensed by the Commission, hereby respectfully requests that the Commission reconsider and reverse that part of its Report and Order, FCC 86-18, 51 Fed. Reg. 3069, released January 16, 1986 (the "Report and Order"), which stipulates that "no amateur station may be operated under automatic control while transmitting third-party traffic." As support for this request, the League states as follows:

1. The Report and Order was issued following receipt of comments in response to a Notice of Proposed Rule Making (50 Fed. Reg. 15196, released April 17, 1985), which in turn was the result of the League's Petition (RM-4879) requesting automatic control of amateur digital communications. The Notice of Proposed Rule Making was an expansion of the League's proposal to the extent that the latter sought only automatic control of

digital communications while the former proposed to permit automatic control of all amateur communications above 29.5 MHz. The Report and Order adopted only the League's proposal to permit automatic control of amateur digital communications on frequencies above 50 MHz.[1/] However, it also held that ". . . we affirm our present rule that requires the control operator to be present at the control point whenever the station is engaging in third-party traffic" (Report and Order, Paragraph 8).

2. The League appreciates the Commission's grant of permission for automatic operation of digital communications above 50 MHz, in response to the League's petition. However, the Commission's interjection of manual control of stations whenever transmitting third-party traffic, if sustained, will have serious negative impact on the development of packet radio and amateur radio public service communications, particularly readiness for emergencies.

3. The development of packet radio is hobbled by the Report and Order in several respects. Chief among them is that the operators of packet repeaters (digipeaters) or computer-based message systems (CBMSs) must, somehow, prevent the transmission of third-party communications except when a control operator is

1/ There are no amateur frequencies between 30 and 50 MHz, hence the specification of the latter as a lower frequency range.

present. Automatic operation, while colorably authorized by the Report and Order, is not legally safe for fear that some other station may send third-party traffic through the digipeater or CBMS at any time. When a digital communication station is under automatic control, there is no sure way of discerning whether the messages are the thoughts of the transmitting station or those of some third party. Thus, the Commission has granted automatic control of digital communications above 50 MHz on one hand while adding third-party language that practically prohibits automatic control on the other. It is a classic "Catch-22" situation.

4. Rules that permit automatic operation except when transmitting third-party traffic and require a control operator to be present when transmitting third-party traffic will inevitably force amateur radio operators to take one of two courses: (a) turn the digipeater or CBMS on only when under operator control and do not use automatic control at any time, or (b) leave it on all the time under automatic control and hope that no one sends third-party traffic through it, or if such traffic is sent, that an FCC Monitoring Station does not issue a notice of violation. Neither of these alternatives appears to be acceptable. If (a) prevails, there will be so few digital communications stations on the air that amateur radio and the public it serves will have lost the allure of an automatic packet-radio network capable of providing almost instantaneous 24-hour-a-day communication anywhere in the nation. If (b) predominates, a wedge will have been driven between the Commission's rules and

the heretofore splendid record of compliance by licensed radio amateurs. We dismiss, as impracticable, the theoretical third course that a station may use automatic control whenever no third-party traffic is being transmitted and manual control when third-party traffic is to be sent. That course would require that an operator be present at a control point at all times during "automatic operation" simply to know when the control operator must be present to oversee the handling of third-party traffic; an absurdity.

5. There are technical differences between digipeaters and CBMSs. The new rules contained in the Report and Order would further set them apart because of the third-party control requirements. The technical difference is that a digipeater receives, then transmits, a message in near real time (perhaps one-half second), while a CBMS receives, then stores, and may retransmit a message when called by another station or may do so automatically to forward the message to its intended destination. The new rules in the Report and Order would have the following effects:

> (a) A digipeater could be automatically controlled when it is simply facilitating communication by repeating between two amateurs who cannot communicate directly, but would have to be manually controlled when transmitting third-party traffic.
>
> (b) A CBMS (by its nature, an automatic message storage and forwarding system) would have to be under manual operation at all times because it will contain, and may transmit, messages originated by third parties, i.e., persons other than the CBMS control

> operator or the other station with which the CBMS station is in communication.

Accordingly, the new rules regarding control of third-party communications would render the digipeater of doubtful utility and the CBMS of practically no use. Yet, in a technical sense, the two differ only in whether or not they store before forwarding.

6. There exists in the rules a tortuous combination of a definition of "third-party traffic" and associated control requirements. One could conclude that they are self-contradictory. Section 97.3 defines third-party traffic as:

> Amateur radio communication by or under the supervision of the control operator at any amateur radio station to another amateur radio station on behalf of anyone other than the control operator.

The International Radio Regulations (Geneva, 1979), Article 32, number 2733 and 2734 simply state:

> (2) It is absolutely forbidden for amateur stations to be used for transmitting international communications on behalf of third parties.
>
> (3) The preceding provisions may be modified by special arrangements between the administrations of the countries concerned.

It is interesting to note that the Radio Regulations offer no definition of "third-party" communications and concern only the transmission of international communication on behalf of third parties. Conspicuous by its absence is any reference to the "control operator," in the Radio Regulations.

7. Neither the Commission's rules nor the Radio Regulations specify the limits of the definition of "third party." If

one interprets literally the definition of "third party" given in Section 97.3 of the Commission's rules, then a "third party" is "anyone other than the control operator" of the two stations in direct radio contact. In a voice repeater operation, there are typically three stations involved: The Section 97.3 definition would appear to say, on its face, that a repeater would always be in third-party communication merely by virtue of the involvement of three stations (control operators or parties) in the communication. Yet, the Commission's rules explicitly permit automatic control for repeater operation under Section 97.85. It may be inferred that the typical repeater communication, involving two amateurs talking together via a repeater, does not constitute "third-party" communication even though it involves three parties. If an acceptable interpretation is that the three-station example does not necessarily involve third-party communication, it then leaves open the questions of whether (a) the number of repeaters, if more than one, or (b) a variable time delay in the repeating process, changes the nature of the process. It would seem from the abovementioned apparent contradiction in the rules that the Commission's intent was to exclude amateur-to-amateur communications (no relay, one relay or several relays; real time, near real time, or delayed) from the effective definition of "third-party" communication. This exclusion would leave the intended definition of "third party" as "a person other than a licensed radio amateur who originates communications, written, oral or otherwise, for transmission via amateur radio."

The Commission's rules do not say that, however; instead the rules are problematic and subject to widely disparate interpretation in this regard.2/

8. The rules changes contained in the Appendix to the Report and Order would make explicit in the text of the rules what was heretofore implicit and subject to interpretation, that automatic control not be used whenever transmitting third-party traffic. This stipulation would apply not only to digital communication but would be applicable to beacon operation, repeater operation and auxiliary operation. In beacon operation, because of its nature, there would be little or no third-party communication. Repeater operation and auxiliary operation would be hampered by the same problems outlined earlier for digital communication. Operators of repeaters and auxiliary links, according to the new rules, should be loath to use automatic control for fear that someone may send third-party communication

2/ The Report and Order is not helpful in this regard. It slavishly adheres to the verbatim definition of "third party traffic" in Section 97.3(v) of the rules. It stated (at Paragraph 4) that:

> Many of the commenters request that high-speed digital operating modes, such as packet switching, bulletin boards, computer-based message systems and electronic mailboxes be exempt from the requirement that the control operator supervise third party traffic.

Actually, what was sought primarily was exemption of intermediate relay stations in digipeater and CBMSs, not exemption of the originating station. The only rationale stated in the Report and Order for denying the same was that it "would be inconsistent with other types of amateur operation."

(which still lacks a clear definition) through them while the control operator is not present at the control point. Of interest is the similarity of control of a network in auxiliary operation and a digital-communication network. In the case of the auxiliary network, the control operator issues the command and subsequent relays in the network automatically perform their functions as commanded. In digital-communication networks, the commands issued by the originating station (in the form of call requests, explicit routing instructions, or other supervisory information contained in the packet header) cause subsequent relays in the network to perform as commanded.

9. While considering the limiting elements of the third-party traffic control operator requirements, one wonders what the effect of the same will be on linear translators, used at VHF in certain parts of the country, and on amateur satellite operation. While there is no specific provision for automatic control of linear translators or satellites, is a control operator of these relay devices required to monitor the entire passband of each device at all times in case third-party traffic is transmitted through the device on some frequency within the passband? As it is impossible as a matter of actual practice to monitor the entire passband simultaneously, are satellite licensees and linear translator licensees in violation of present control operator requirements?

10. Although the prohibition of automatic control when transmitting third-party traffic would apply equally to all types

of operation where automatic control is at times permitted, there are profound differences in the practicality, apart from the desirability, of the exercise of control. In every case under automatic control, it is impractical for the control operator to know whether or not third-party traffic is being transmitted through the station because, quite properly, the Commission's rules do not require a control operator to be present at a control point when the station is under automatic control:[3/]

> (a) In the case of the more-familiar voice repeater operation, however, it is possible for the control operator to simply keep "half an ear open" for the activity on a voice repeater by keeping a receiver on at low volume at home, at work or in the car. Effective control of a voice repeater can be effected shortly after a third-party communication is transmitted--as quickly as it takes to get to the remote control equipment (a telephone if by wire or via auxiliary radio

3/ As the League's Comments in this proceeding noted, a potential for abuse by unlicensed individuals in a digital amateur radio system exists only at the point where the third-party traffic is originated and introduced into the amateur radio medium. It is at this point and only at this point that the control operator should be required.

equipment operating above 220.5 MHz.) In the case of a voice repeater, there is only one conversation going on at any time, the language is well understood by the control operator, and the speed of communication is that of normal speech (a maximum of about 300 words per minute [WPM]). For those periods when the control operator is not present at the control point, the control operator's habit of keeping half an ear open supplemented by being alerted by others who are doing the same thing adds up to effective control of a voice repeater.

(b) In the case of digital communication, it is meaningless to simply "keep an ear open" for a digipeater or CBMS to "hear" whether or not third-party traffic is being transmitted. It requires a video display terminal (VDT) or a printer to make the communication visible to the control operator. Above 50 MHz, there are no amateur packet-radio circuits in the United States that operate at speeds less than 1200 bits per second, which translates to about 1440 WPM. The average person cannot read faster than

about 300 WPM. Because of the speeds involved, it is not practical to even "keep an eye open" for third-party traffic passing through a digipeater or CBMS because even the control operator's full time and attention (a 300-WPM reading speed) would be insufficient to read all the traffic. To be in full compliance with the Commission's rules, a control operator would have to not only give full time and attention to monitoring the digipeater or CBMS, but would have to slow the network down to his or her reading speed. The Commission's rules permit speeds of 19,600 bauds (equivalent to at least 23,520 WPM) between 50 and 220 MHz. This speed restriction comes at a time when amateur packet-radio operators have come to a conclusion that 1200 bauds is too slow for efficient operation and are phasing in 9600-baud operation. Even that speed will be too slow to handle network requirements by 1987, when an upgrade of intercity trunks to 56,000 bauds is desirable. Paragraph 4 of the Report and Order seems to dismiss speed as a

consideration.[4/] However, to dismiss the higher speeds in this perfunctory manner is to reduce digital communication in the Amateur Radio Service from a resource of great potential public service to the status of a mere toy.

11. Another issue raised is how fast a control operator is obliged to intervene after detecting an improper third-party

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4/ To the extent, however, that speed of digital communication creates a lack of "monitorability" by a control operator of a relay station, the need for the control operator diminishes. The Commission has held that lack of ability to decipher communications "in transit" should not be an obstacle to the development of new technology in the Amateur Radio Service. In authorizating unspecified digital codes, the use of which could inhibit the Commission's ability to monitor coded transmissions for content as well as the ability of the amateur community to monitor transmissions for purposes of self-enforcement, the Commission held that:

> In balancing our objectives of encouraging new technologies against assuring our enforcement capability, it must be recognized that there is an incompatibility between authorizing experimentation with "exotic" technologies and the employment of channel monitoring as an enforcement tool. Our ability to verify that the content of messages complies with our rule requirements will be hindered by the broad relaxation of regulatory constraints that we are ordering in this proceeding. However, the Commission finds itself in agreement with the ARRL that special provisions we are including in the final rules, . . . combined with the zealous effort of the amateur community to protect their allocated frequency bands, provide adequate protection against unauthorized operation in the service. (See Report and Order, FCC 82-413, released September 21, 1982.)

The situation with automatic control of digipeaters and CBMSs provides a far greater ability to safeguard against unsupervised third-party use of the network. See Paragraph 15 hereinbelow.

communication such as commercial traffic. It is not purely academic, as packet-radio operators must know their obligations under the rules. This question surfaces after careful examination of the differences between voice and digital communication. In voice repeaters, it must be recognized that the automatic push-to-talk circuitry of the repeater is such that two stations could engage in third-party communication so brief that the control operator could intervene only after the fact. It is not the practice for the control operator to first receive the third-party message, decide whether or not it is permitted, then retransmit it. In other words, there is no a priori censorship. If the third-party traffic is automatically repeated and is judged to be improper by the control operator, it is the usual practice for the control operator to issue a warning to the offender(s). In packet radio, amateur radio practice (i.e., no a priori censorship; issue warnings afterwards) has been essentially the same. There is a difference between the improper transmission and the issuance of the warning, however. In voice-repeater operation, the warning is issued within a few seconds after the occurrence or not at all (if missed by the control operator). There is usually no magnetic tape record to audit after the fact. In packet radio, the elapsed time between an improper transmission and the warning may be from a few minutes to perhaps as long as a day. However, there is normally a record of the message and logging information on magnetic disk of a CBMS. It will be a necessity for amateurs to continue such

records in the further development of a packet-radio network for network-management and troubleshooting reasons alone. These records will be valuable in preventing use of the network by interlopers.

12. The crippling third-party control requirements have been interjected at a time when packet radio has seen phenomenal growth from around 4,000 stations a year ago to approximately 14,000 stations now. Part of its appeal, no doubt, can be assigned to its technical novelty as a fast method of transmitting written communications directly between two amateur stations. Also part of its present attraction is the automatic near-real-time repeating or store-and-forward transfer of messages through up to 8 digipeaters and CBMSs. Yet these digipeater and CBMS facilities represent only the very beginning of what amateurs envisage as an amateur packet-radio network. Such a network will involve "packet switching," a technique specifically included by the Commission when it first permitted ASCII in the Amateur Radio Service at the conclusion of Docket 20777 and presently permitted at Section 97.69 of the Commission's rules. The language of the Third Report and Order in Docket 20777 and numerous conversations with FCC staff at that time made it clear that the Commission and staff fully intended to permit and encourage packet switching. Subsequent rule changes are in conflict with that intent, namely:

> (a) the third-party control provisions of the Report and Order in this proceeding, discussed above, and

(b) amendment of the emission designators in the Third Report and Order of General Docket 80-739, which omitted the proper emission designators for packet radio, not to mention other popular modes used in the Amateur Radio Service.5/

13. In recent discussions, Commission staff have indicated to League representatives that it is not the Commission's intent nor desire to frustrate or impede the development of the amateur packet-radio network. Yet the Report and Order in the instant proceeding will have a devastating effect on current packet-radio operations and will inhibit further growth, inevitably relegating packet radio to the status of stillborn technology. There is no doubt that the Report and Order has already had just such an effect in the amateur packet-radio community. Some amateurs have responded defensively by seeking advice from others which in some cases has been dispensed without full possession of the facts involving the regulatory history of automatic operation, third-party traffic and digital communication in the Amateur Radio Service. Others, more defensively, have turned off their VHF digipeaters and CBMSs for fear that they may inadvertently transmit third-party traffic under automatic operation. The

5/ The incompleteness of the emission designators was noted in League Comments filed in PR Docket 85-23, but the errors were never corrected in that proceeding or to this day. Suffice it to say that the FCC staff was informally made aware of the incompleteness of the emission designators within a few days of the release of the Third Report and Order of General Docket 80-739. Accordingly, the Commission will be asked again formally to correct the present table of emission designators.

instant Report and Order has stalled the job of building an amateur packet-radio network. The amateur who epitomizes the kind of high-technology experimenter sought by Section 97.1(b) of the rules is demoralized by the outcome of this proceeding.

14. It is the League's understanding through discussions with Commission staff that the Commission's main concern is to prevent unlicensed persons from unsupervised access to amateur radio or an amateur radio network. The League shares this concern and will staunchly defend against such unsupervised access. It is also undoubtedly the Commission's intent to encourage amateur contributions to the advancement of the radio art in general, and development of a packet-switched network in particular, and not to frustrate or impede its development. It is possible, however, to permit true automatic control throughout a packet-radio network while simultaneously providing safeguards against unsupervised third-party use of the network.

15. The key to achieving the aforementioned goal is in the control of the introduction of third-party traffic, not its subsequent repeated automatic relays throughout the network. This view was offered in the League's Comments dated June 26, 1985, and considered, but not heeded, by the Commission in preparation of the Report and Order in this proceeding. Controlling the introduction, rather than relay, of third-party communications is pivotal to the functioning of a packet-radio network. Amateurs can effectively exclude improper third-party communications from the amateur radio network by controlling its

introduction and, realistically, only at that stage. All written messages prepared under the ARRL message format have a serial number assigned by the station of origin as well as the call sign of the station of origin. It not only takes a deliberate act on the part of the control operator at the station of origin to introduce the message into the network, but there is a "trail of accountability" throughout the transmission and storage life of the message by virtue of the serial number and station of origin in the message heading. If the message transits packet-radio CBMSs operating with current software, the verbatim record of the message exists on magnetic medium, along with a capability of producing detailed logs of the message transfers and a history of who accessed them.

16. It adds no protective value to amateur radio, to the network, or to the public to have each third-party communication personally checked and re-released by the control operator at every transit point along its journey through the network. Rather, as discussed above, such a requirement would greatly impede, and perhaps block, traffic through the network (assuming that amateurs would decide to build the network under such circumstances). No communication network could possibly be considered efficient and effective if every communicator at every relay station along the route must read, then decide whether or not to veto each message handled by that station. In fact, such a criticism of the ARRL National Traffic System has already been levied by the National Communications System in connection with

exercise "Night Tango" as the result of an amateur thinking that a post-nuclear attack drill message was improper. In most communications networks, individual stations have no authority to veto messages but are obliged to pass them on to their destination. Furthermore, a relay station is usually not able to judge the propriety of a context of, for example, an emergency situation. It is obvious that a Red Cross message ordering batteries may or may not be proper depending upon whether or not an emergency exists in the area where needed.

17. It is not often practical for a digital-communication relay point to judge the propriety, or even always recognize, a transmission on behalf of a third party. In packet radio, a message is broken up into packets, usually one line of text long. In isolation, a single packet may be meaningless as it is viewed out of context. Depending upon the networking protocol eventually adopted for amateur packet radio, all packets constituting a message may not necessarily transit the same switches, as it is possible for each packet to be dynamically routed under a datagram type of networking protocol. The only points in a datagram network where the entire message may be seen is at the station of origin, the destination, and any switching nodes around which there are no alternative routes. Except at the station of origin, the packets need not be in the order originated. Thus, the reality of present-day amateur digital technology is that only at the point of origin can a control operator requirement be properly applied.

18. The question of risk vs. benefit in considering manual control throughout an amateur packet-radio network while handling third-party traffic should be resolved in favor of the benefit of the efficient functioning of the network. In the opinion of the League, the widespread public benefit of having a high-speed packet-radio network with the capacity of handling major emergencies far outweighs the narrow risk of unsupervised use of the network by unlicensed persons.[6/] In fact, the risks are finite and controllable by supervising the introduction of third-party communications. Improperly supervised introduction of third-party communications by a station of origin (whether licensed or unlicensed) would be detected in adequate time to curtail further abuses by that station. Improper communications would be detected by other packet-radio stations monitoring the traffic on a digipeater or CBMS frequency, and by the control operator of a CBMS when scanning messages stored and printing out logs of access and message-transmission activity. Higher-level packet switches and message-storage-and-retrieval systems to come will inevitably make even greater use of sophisticated logging procedures, which will be essential to proper overall network management. Requiring that the amateur packet-radio network

6/ The Commission in the past has been willing to permit that minimal risk in order to foster use and development of new technology. It has done exactly the opposite in this proceeding. See Footnote 4 hereinabove.

manually control each relay stations when transmitting third-party traffic would only slightly reduce the risk while sacrificing the far-greater benefit.

19. It is clear that technology has overtaken some aspects of Part 97 of the Commissions rules, particularly in regard to automatic control. An information explosion has taken place, and amateur radio cannot continue to function as though it had not. The rules can and should be amended in a way that will harmonize the need to keep up with the information speed and volume yet protect against unsupervised third-party intrusion into the amateur radio network. Unnecessary regulatory underbrush has thus far choked out amateur technological advancement.

THEREFORE, the Commission should reconsider and revise its rules in accordance with the attached Appendix and thus modify the Report and Order in this proceeding.

Respectfully submitted,

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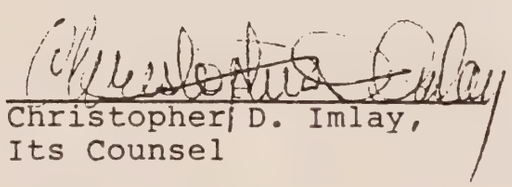
By: 
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APPENDIX

Part 97 of Chapter I of Title 47 of the Code of Federal Regulations is amended, as follows:

1. The authority citation for Part 97 continues to read as follows:

   Authority citation: 48 Stat. 1066, 1082, as amended; 47 U.S.C. 154, 303.

2. Section 97.3 (m) (3) is amended to read:

   §97.3 Definitions.

   * * * * *

   (m) * * *

   (1) * * *

   (2) * * *

   (3) Automatic control means the use of devices and procedures for control without the control operator being present at the control point when the station is transmitting.

3. Section 97.79 (b) is amended to read as follows:

   §97.79 Control operator requirements.

   (b) Every amateur radio station, when transmitting, must have a control operator. The control operator must be present at the control point of the station when the station is transmitting, except when the station is transmitting under automatic control. The control operator must be a licensed amateur radio operator or permittee designated by the station licensee. The colerator and the station licensee are both responsible for the proper operation of the station. For purposes of enforcement of the rules of this part, the FCC will presume that the station licensee is the control operator of the station, unless documentation to the contrary exists.

4. Section 97.69 is amended by adding a new paragraph (d), as follows:

§97.69 Digital communications.

* * * * *

(d) An amateur station may be under automatic control when transmitting digital communications on frequencies 50 MHz and above.

5. A new section 97.80 is added, as follows:

§97.80 Operation under automatic control.

(a) When under automatic control, devices must be installed and procedures must be implemented which will ensure compliance with the rules when the control operator is not present at the control point of the amateur station.

(b) No amateur station may be operated under automatic control while originating third-party traffic.

(c) Automatic control of an amateur station must cease upon notification by the Engineer-in-Charge of a Commission field office that the station is transmitting improperly or causing harmful interference to other stations. Automatic operation must not be resumed without prior approval of the Engineer-in-Charge.

6. Section 97.85 is amended by deleting and reserving paragraph (e), as follows:

§97.85 Repeater operation.

* * * * *

(e) Reserved.

* * * * *